

Patent Claims

1. A method for determining coordinates of a workpiece (9), in which

- 5 - a first coordinate system which is fixedly positioned with reference to the workpiece (9) is defined,
- first coordinates of the workpiece (9) are measured by using a first coordinate measuring
10 device (3),
- second coordinates of the workpiece (9) are measured by using a second coordinate measuring
 device (5),
- 15 - a common set of coordinates in the first coordinate system or in a second coordinate system fixedly positioned with reference to the workpiece (9) is generated from the first coordinates and from the second coordinates,
- the workpiece (9) is fastened on a pallet (7)
20 during the measurements carried out by the coordinate measuring devices (3, 5),
- at least one reference object (8) is fastened on the pallet (7), and
- reference coordinates of the reference
25 object(s) (8) are measured by the first coordinate measuring device (3) and by the second coordinate measuring device (5), and the common set of coordinates is generated by using the reference coordinates.

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2. The method as claimed in claim 1, in which the pallet (7) with the workpiece fastened thereon is transported from a first measuring station (14) in which the workpiece (9) is measured by one of the
35 coordinate measuring devices (3, 5) to a second measuring station (15) in which the workpiece (9) is measured by the other coordinate measuring device (3, 5).

3. The method as claimed in claim 1 or 2, in which coordinates of the workpiece (9) and reference coordinates of the reference object(s) (8) are measured
5 by the first coordinate measuring device (3), by the second coordinate measuring device (5) or by a further coordinate measuring device, in which information relating to a relative position and orientation of the
10 reference object(s) (8) on the one hand and of the workpiece (9) on the other hand is obtained therefrom, and in which the common set of coordinates is generated by using the information relating to the relative position and orientation.

15 4. The method as claimed in one of claims 1 to 3, in which the reference object(s) (8) with the workpiece (9) fastened thereon is or are moved into a defined position that is fixed with reference to the first coordinate measuring device and/or with reference to
20 the second coordinate measuring device, and in which at least some of the reference coordinates, the first coordinates and/or the second coordinates are measured while the reference object(s) (8) is or are located in the defined position.

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5. The method as claimed in one of the preceding claims, in which different measurement principles are applied for measuring the coordinates in the first coordinate measuring device (3) and in the second
30 coordinate measuring device (5).

6. The method as claimed in one of the preceding claims, in which a surface of the workpiece (9) is scanned by the first coordinate measuring device (20),
35 and coordinates of at least one point on the surface of the workpiece (9) are measured thereby.

7. The method as claimed in one of the preceding claims, in which a material of the workpiece (9) is transirradiated by the second coordinate measuring device (16, 17), and coordinates of at least one point
5 of the workpiece (9) are determined therefrom.

8. The method as claimed in one of the preceding claims, in which measured values of the workpiece (9) and/or of a reference object (8) are/is measured at the
10 second coordinate measuring device (16, 17) in a spatial area in which an edge or material transition of the workpiece (9) and/or of the reference object (8) is located, and in which the first coordinates measured by the first coordinate measuring device (20) are used for
15 the purpose of assigning to one another a position of the edge or of the material transition and the measured values.

9. A method in which coordinates of a multiplicity of
20 workpieces (9) are determined during and/or after a production process and/or machining process of the workpieces (9) in accordance with the method as claimed in one of the preceding claims.

25 10. The method as claimed in one of claims 1 to 9, in which a temperature is measured and a variation in the temperature that can take place during a measurement by one of the coordinate measuring devices (3, 5) and/or between measurements by different ones of the
30 coordinate measuring devices (3, 5) is determined, and in which variations in the relative position and the scalings of a coordinate system defined by the reference objects and of a coordinate system belonging to the workpiece are calculated taking account of
35 coefficients of thermal expansion of materials of the pallet (7) and of the workpiece (9).

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11. A measuring arrangement (1) for determining coordinates of a workpiece (9), in which the measuring arrangement (1) exhibits the following:

- 5 - a first coordinate measuring device (3) for measuring first coordinates of the workpiece (9),
- a second coordinate measuring device (5) for measuring second coordinates of the workpiece (9), and
- 10 - a determining device (11) that is connected to the first and the second coordinate measuring device (3, 5) and is fashioned for generating a common set of coordinates for the workpiece (9) from the first coordinates and from the second
- 15 coordinates, the common set of coordinates being defined in a coordinate system that is fixedly positioned with reference to the workpiece (9),
- a pallet (7) on which at least one reference
- 20 object (8) is fastened for the measurement of reference coordinates of the reference object(s) (8) by the first and second
- coordinate measuring devices (3, 5), the workpiece (9) being, or being capable of being
- 25 fastened on the pallet.

12. The measuring arrangement as claimed in the preceding claim, having a movement device (12) that is fashioned for bringing the workpiece (9) into a

30 measuring position in which the first coordinate measuring device (20) and/or the second coordinate measuring device (16, 17) can measure the first and/or the second coordinates of the workpiece (9).

35 13. The measuring arrangement as claimed in the preceding claim, in which the movement device (12) is fashioned for sequentially bringing a multiplicity of the workpieces (9) into the measuring position.

14. The measuring arrangement as claimed in one of the preceding claims, in which a temperature sensor is integrated in the pallet (7).